IYTE CIVIL ENGINEERING DEPARTMENT

CE 371 HYDROMECHANICS
2024-2025 FALL SEMESTER

Instructor:
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Objectives:
1. Basic concepts and laws related to hydraulics. 2. Analysis and design of pressurized pipe systems. 3. Analysis of gradually and rapidly varied flow. 4. Analysis and design of water distribution networks 5. Analysis of open channel flows, channel transitions and calculations of free surface profiles 6.Safe and economical design of open channels.

Reference Books:
Çengel, Y.A., Cimbala, J.M. Fluid Mechanics Mc Graw Hill , 2nd ed.New York , 2010
Munson, B. R., Young, D. F., and Okiishi, T. H., Fundamentals of Fluid Mechanics, John Wiley and Sons Inc., 7th edition, U.S.A., 2013.
Kundu, P.K., Cohen, I.M. Fluid Mechanics Elsevier Academic Press, Third Edn. , New York , 2004
Chow, V. T. Open-Channel Hydraulics, McGraw-Hill, Kogakusha, Tokyo 1959

Tentative Course Outline:

Week	Experiment	Topic
1		Introduction and basic laws
2	1	basic laws and concepts of hydromechanics
3	2	General Characteristics of Flow in Closed Conduits
4	3	Computation of Flow in Single Pipes
5	4	Velocity measurement and Nonuniform Flow
6	5	Pipeline Systems, Hardy-Cross method
7		**Midterm I**
8		General Characteristics of Open Channel Flow

9		Uniform Flow, Specific-Energy Concept
10		Channel transitions
11	6	Rapidly varied low, Specific Force Concept
12		Gradually and Rapidly Varied Flow
13		**Midterm II**
14	7	Design of Open Channels for Uniform Flow
15		Design of Open Channels for Uniform Flow

Experiment # 1: Jet impact

Experiment # 2: Bernoulli

Experiment # 3: Reynold's experiment

Experiment # 4: Energy Losses

Experiment # 5: Orifice and Free jet

Experiment # 6: Weir measurements

Experiment # 7: Open channel

Course Requirements

- 3 hours lecture +2 hours laboratory or recitation per week
- Two mid-term examinations and a final examination
- Laboratory reports

Grading:

2 Midterms: each 25%, Final Exam: 35%
Lab Reports 15%
Attendance (at least 50% not to get NA)
Announcements and lecture notes can be followed by Microsoft Teams